

REMARKS

Favorable reconsideration of this application, in light of the following discussion and in view of the present amendment, is respectfully requested.

Claims 1-2 and 4-5 are amended. Claims 9-10 are added. Claims 1-6 and 9-10 are pending in the application.

Page 1: Acceptance of the Drawings

The drawings were not acknowledged as either accepted or objected to by the Examiner. Accordingly, applicants request that a determination is made as to the acceptability of the drawings.

Page 2: Rejection under 35 U.S.C. § 112

In the Office Action, at page 2, claims 1-6 were rejected under 35 U.S.C. § 112, 2nd as being indefinite. Claims 1-2 and 4-5 were amended to overcome the rejection, and accordingly, withdrawal of the § 112 rejection is respectfully requested.

Page 3: Rejection under 35 U.S.C. § 102

In the Office Action, at page 3, claims 1-6 were rejected under 35 U.S.C. § 102(b) as being unpatentable over U.S. Patent No. 5,271,146 to Kashiwagi. This rejection is respectfully traversed because Kashiwagi does not discuss or suggest that:

the bottom of the first concavity of the die has a second concavity, which is dented relative to the bottom, so as not to come into contact with the lead frame during the press forming thereof, and the punch has a front end opposite to the bottom of the first concavity of the die, the front end being formed so as to have a portion partially spreading over the second concavity,

as recited in independent claims 1 and similarly in independent claim 4.

As a non-limiting example, the present invention is a device for fabricating a lead frame by press forming. A die is provided that has flat faces and a concavity defined between the flat faces. The die has fabricating faces that extend from bottom portions of the concavity to the flat faces through slants interposed between the bottom portions of the concavity and the flat faces of the die. A recess is defined between the bottom portions of the concavity. A punch has punching faces formed to be opposite to the fabricating faces of the die for fabrication of a lead frame by press forming. The punch has a front end opposite to the bottom portions of the concavity and is formed so as to have a portion partially spreading over the recess.

Kashiwagi discusses a die and a punch. In Kashiwagi, "the die has, on its upper surface, an inner guide projection defining a central recess receptive of the body of the electronic component, and an outer guide projection extending around the inner guide projection, with an annular recess defined between the inner guide projection and the outer guide projection." Kashiwagi also discusses that "the punch has a punch blade projecting from a lower end of the punch and having a shape substantially complementary in contour to the shape of the recess. When the cylinder actuator is drive to lower the upper mold, the punch blade moves into the recess." Kashiwagi only discusses that there is a single recess. Kashiwagi does not discuss or suggest that a first concavity is dented relative to the flat face of the die and that a second concavity is dented relative to the bottom of the first concavity. Kashiwagi merely discusses a single concavity, but not a second concavity between the bottom of the first concavity. Further, Kashiwagi does not discuss or suggest that the fabricating face extends from the bottom of the first concavity, which has a second concavity dented relative to the bottom of the first concavity, through a slant, to the flat face of the die. Kashiwagi does not discuss or suggest a front end of a punch formed so as to have a portion partially spreading over the second concavity. Additionally, Kashiwagi does not discuss or suggest that the lead frame to be press formed does not come into contact with a second concavity or bottom concavity of the first concavity. Kashiwagi instead shows that the lead comes into contact with the bottom of the only concavity of the die.

Therefore, as Kashiwagi does not discuss or suggest that "the bottom of the first concavity of the die has a second concavity, which is dented relative to the bottom, so as not to come into contact with the lead frame during the press forming thereof, and the punch has a front end opposite to the bottom of the first concavity of the die, the front end being formed so as to have a portion partially spreading over the second concavity," as set forth in claim 1 and similarly in claim 4, claims 1 and 4 patentably distinguish over the prior art.

Claims 2-3 and 5-6 depend directly or indirectly from claims 1 and 4, respectively, and include all the features of those claims, plus additional features that are not discussed or suggested by the reference relied upon. For example, claim 2 recites that "the lead frame to be fabricated by bending has a die-pad, on which a semiconductor chip is to be mounted, and support bars for supporting the die-pad, and wherein the first concavity of the die is formed such that the die-pad of the lead frame is located over the first concavity and the respective support bars of the lead frame straddle the first concavity when the lead frame is placed on the flat face of the die, whereby the support bars of the lead frame are held between the fabricating face of the die and the punching face of the punch." Therefore, as claims 2-3 and 5-6 are dependent

from independent claims 1 and 4, respectively, these claims patentably distinguish over the reference relied upon. Accordingly, withdrawal of the § 102(b) rejection is respectfully requested.

New Claims

New claim 9 recites the features of the present invention include a “die having a first concavity and a second concavity defined within the first concavity, with the second concavity preventing a portion of the lead frame from warping during press forming and preventing the portion of the lead frame from being molded.” Nothing in the reference relied upon discusses or suggests a second concavity defined within a first concavity, nor does the reference discuss or suggest that the second concavity prevents a portion of the lead frame from warping during press forming. It is submitted that the new claim 9, which is different from prior filed claims, distinguishes over the reference relied upon.

New claim 10 depends from claim 9 and includes all the features of claim 9, plus additional features which distinguish over the reference relied upon. For example, claim 10 recites that the punch has opposite front ends defining a void between the front ends, such that during fabrication, the punch does not come into contact with the lead frame in an area above the center of the second concavity.” Nothing in the reference relied upon discusses or suggests such. It is submitted that this new claim distinguishes over the prior art.

Conclusion

In accordance with the foregoing, claims 1-2 and 4-5 have been amended. Claims 7-8 have previously been cancelled. Claims 9-10 have been added. Claims 1-6 and 9-10 are pending and under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 1/20/06

By: 
Kari P. Footland
Registration No. 55,187

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501